

National Textile University

Department of Computer Science

Subject:
Operating System
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Semester: 5 th - A

LAB-3-Home-Task

Part 1: File and Directory Operations

1. Create the following directory structure in your home directory:

- 2. Inside docs/:
 - Create three files: intro.txt and notes.txt and summary.txt
 - Add at least two lines of text into each using echo >>.
 - Copy summary.txt into the drafts/ folder using **cp** command.

```
Obail_arwar@SALMAN:~/Lab_3/docs$ echo "This is second line in intro file." >> intro.txt

ohail_arwar@SALMAN:~/Lab_3/docs$ echo "These are notes." >> notes.txt

ohail_arwar@SALMAN:~/Lab_3/docs$ echo "This is second line in notes." >> notes.txt

ohail_arwar@SALMAN:~/Lab_3/docs$ echo "Summary starts here." >> summary.txt

ohail_arwar@SALMAN:~/Lab_3/docs$ echo "This is second line in summary." >> summary.txt

ohail_arwar@SALMAN:~/Lab_3/docs$ cp summary.txt drafts/

ohail_arwar@SALMAN:~/Lab_3/docs$

□ Summary.txt drafts/

ohail_arwar@SALMAN:~/Lab_3/docs$
```

- 3. Inside data/raw/:
 - Create two files: raw1.txt, raw2.txt
 - Append the current date into cp command. raw1.txt using the date command.
 - Move raw2.txt into processed/ using mv source destination mv. The syntax is: mv source destination

- 4. Inside scripts/:
 - Create a script named hello.sh with the following content:
 echo "Hello World"
 pwd
 ls -lh
 - Later, you will make it executable (in Part 3).

```
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Ohail_arwar@SALMAN:~/Lab_3/scripts$ echo 'echo "Hello World"' >> hello.sh

Ohail_arwar@SALMAN:~/Lab_3/scripts$ echo 'pwd' >> hello.sh

Ohail_arwar@SALMAN:~/Lab_3/scripts$ echo 'pwd' >> hello.sh

Ohail_arwar@SALMAN:~/Lab_3/scripts$ echo 'ls -lh' >> hello.sh

Ohail_arwar@SALMAN:~/Lab_3/scripts$

Ohail_arwar@SALMAN:~/Lab
```

5. Display the directory structure recursively and take a screenshot:

```
./data/raw:
raw1.txt
./docs:
drafts intro.txt notes.txt summary.txt
./docs/drafts:
summary.txt
./scripts:
hello.sh
ohail_arwar@SALMAN:~/Lab_3$
```

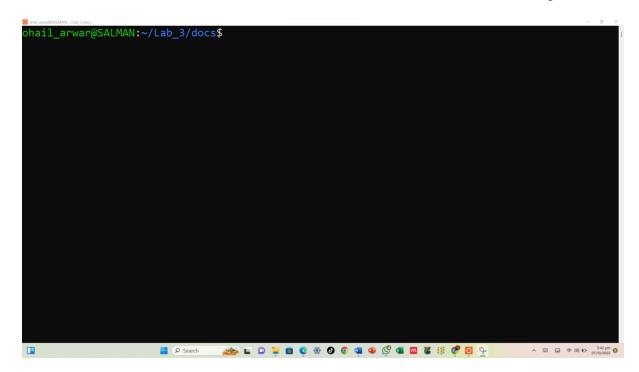
Part 2: Practice with Basic Linux Commands

Run the following commands inside Lab_3/ and note their outputs:

- pwd → Show current working directory.
- whoami \rightarrow Display the current logged-in user.
- touch extra.txt \rightarrow Create an empty file.
- cat intro.txt \rightarrow Display file contents.
- rm extra.txt \rightarrow Delete a file.
- history | tail -n 5 \rightarrow Show your last 5 executed commands.

```
hail_arwar@SALMAN:~/Lab_3$ cd ~/Lab_3/docs
ohail_arwar@SALMAN:~/Lab_3/docs$ pwd
/home/ohail_arwar/Lab_3/docs
ohail_arwar@SALMAN:~/Lab_3/docs$ whoami
ohail_arwar
ohail_arwar@SALMAN:~/Lab_3/docs$ touch extra.txt
ohail_arwar@SALMAN:~/Lab_3/docs$ cat intro.txt
This is an intro file.
This is second line in intro file.
phail_arwar@SALMAN:~/Lab_3/docs$ rm extra.txt
ohail_arwar@SALMAN:~/Lab_3/docs$ history | tail -n 5
  363 whoami
364 touch extra.txt
365 cat intro.txt
366 rm extra.txt
367 history | tail -n 5
phail_arwar@SALMAN:~/Lab_3/docs$
                         📑 O Search 🔊 🖻 🗅 🚊 📵 🖒 🐼 💿 🍳 🐞 🚱 🚾 🚾 🏗 🍇 🗞 🛅 🚡
                                                                                               ^ □ □ ♦ Φ D 5:40 pm 07/10/2025
```

• clear → Clear the terminal. Take screenshots of commands and outputs



Part 3: File Permissions and Ownership

- 1. Change the permissions of hello.sh so that:
 - Owner → Read, Write & Execute
 - Group → Read, Write & Execute
 - Others \rightarrow No permissions
 - Run the script using:

./hello.sh

- 2. Change the permissions of intro.txt using numeric notation so that:
 - Owner → Read & Write

- Group → Read & Write
- Others \rightarrow Read only 3.
- 3. Change the permissions of **notes.txt** using **symbolic notations** so that **others** have any permission on it.
- 4. Verify all changes with:

```
1s-1
 hail_arwar@SALMAN:~/Lab_3/docs$ cd ~/Lab_3/scripts
ohail_arwar@SALMAN:~/Lab_3/scripts$ chmod 770 hello.sh
ohail_arwar@SALMAN:~/Lab_3/scripts$ ./hello.sh
Hello World
/home/ohail_arwar/Lab_3/scripts
total 4.0K
-rwxrwx--- 1 ohail arwar ohail arwar 30 Oct 7 17:27 hello.sh
chail_arwar@SALMAN:~/Lab_3/scripts$ cd ~/Lab_3/docs
phail_arwar@SALMAN:~/Lab_3/docs$ chmod 664 intro.txt
ohail_arwar@SALMAN:~/Lab_3/docs$ chmod o-rwx notes.txt
ohail_arwar@SALMAN:~/Lab_3/docs$ ls -1
total 16
drwxr-xr-x 2 ohail_arwar ohail_arwar 4096 Oct 7 17:17 drafts
-rw-rw-r-- 1 ohail_arwar ohail_arwar 58 Oct 7 17:15 intro.txt
-rw-r---- 1 ohail_arwar ohail_arwar 47 Oct 7 17:15 notes.txt
-rw-r--r-- 1 ohail_arwar ohail_arwar 52 Oct 7 17:16 summary.txt
ohail_arwar@SALMAN:~/Lab_3/docs$
                           🔡 🔎 Search 🔑 🖺 🔘 🖺 📵 🕲 🚱 🧿 🚳 🚳 💖 🕮 🖾 🈿 🥙 🐼 👺
```

Part 4: Reading and Searching Files

Inside docs/:

- 1. Count the number of lines, words, and characters in **notes.txt** using **wc**
- 2. Show only the first 2 lines of summary.txt using head -n 2
- 3. Show the last line of summary.txt using tail -n 1
- 4. Search for a keyword (of your choice) in **intro.txt** using **grep**.

```
ohail_arwar@SALMAN:~/Lab_3/docs$ wc notes.txt

2 9 47 notes.txt

ohail_arwar@SALMAN:~/Lab_3/docs$ head -n 2 summary.txt

Summary starts here.

This is second line n summary.

ohail_arwar@SALMAN:~/Lab_3/docs$ tail -n 1 summary.txt

This is second line n summary.

ohail_arwar@SALMAN:~/Lab_3/docs$ grep "Summary" intro.txt

ohail_arwar@SALMAN:~/Lab_3/docs$ grep "intro" intro.txt

This is an intro file.

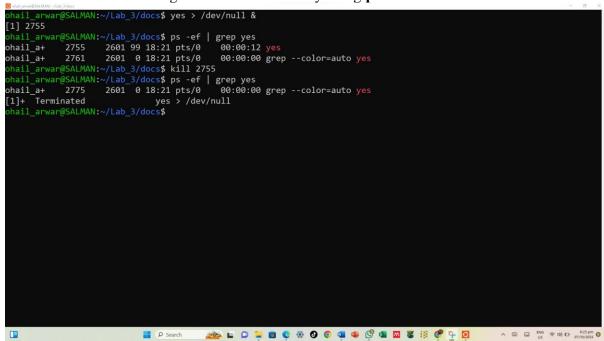
This is second line in intro file.

ohail_arwar@SALMAN:~/Lab_3/docs$
```

Part 5: Linux Process Commands

- 1. Exploring Processes
 - Use **ps -ef** and identify 3 processes running on your system. Note their PID, PPID, and command.
 - Run **top** for 20–30 seconds. Write down:
 - Which process is consuming the most CPU
 - ➤ Which process is consuming the most memory

- 2. Practice with Infinite Process
 - Start: yes > /dev/null &
 - Locate its PID using ps -ef | grep yes
 - Kill it using **kill <PID>** and verify using **ps**



3. Foreground & Background Jobs

- Run sleep 60 in foreground and terminate it with Ctrl + C.
- Run **sleep 60 &** in **background**, bring it to foreground with **fg**, stop using **Ctrl** + **Z**, then resume in background using **bg**.

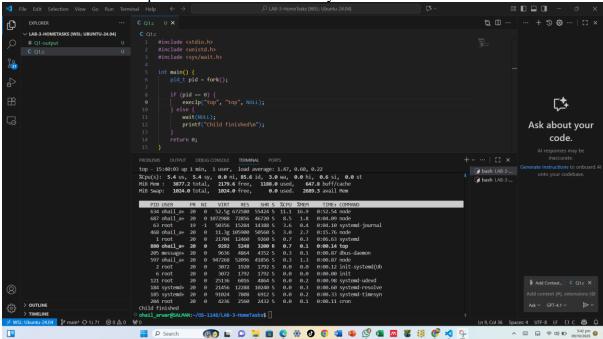
```
Ohail_arwar@SALMAN:~/Lab_3/docs$ sleep 60
^C
Ohail_arwar@SALMAN:~/Lab_3/docs$ sleep 60 &
[1] 2821
Ohail_arwar@SALMAN:~/Lab_3/docs$ fg
sleep 60
^Z
[1]+ Stopped sleep 60
Ohail_arwar@SALMAN:~/Lab_3/docs$ bg
[1]+ sleep 60 &
Ohail_arwar@SALMAN:~/Lab_3/docs$

Ohail_arwar@SALMAN:~/Lab_3/docs$
```

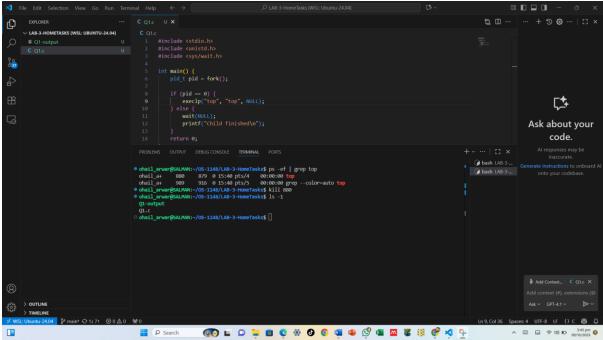
Part 6: C Programs on Processes

Program 1 – Exec with top

- Modify the exec program so that the child runs **top** instead of **ls-l.**
- Run the program.
- In another terminal, use **ps -ef | grep top** (or run **top**) to find the child's PID.
- Use the child's process ID to kill it manually.



Second Terminal:



Program 2 – Incomplete Program

